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ABSTRACT

This report presents the results of a study conducted at Northern Michigan University's (NMU) Olson Library to determine the adequacy of the preparation of NMU students for library research, the soundness of the instructional objectives set for the freshman and sophomore class levels, and possible weak points in the program's coverage. The Library Skills Test developed by the Illinois Association for College and Research Libraries was the instrument used in the study. The test was supplemented with a series of additional questions on the background and experience of the students. The study results indicate that the library instruction program might focus in particular upon skills relating to location of materials arranged by the Library of Congress classification system; use of book indexes and periodical abstracts to locate relevant information; and recognition of the different citation forms for books, periodicals, and other library resources. It was found, however, that the entering NMU student has generally received adequate high school library instruction. Concluding the report are the following appendixes: Olson Library's library instruction goals and objectives; the Illinois Association of College and Research Libraries' Library Skills Test together with additional questions designed to obtain information on the students; and tables and graphs displaying the results of the analyses of study data. (MAB)

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ED339370

NORTHERN MICHIGAN UNIVERSITY

OLSON LIBRARY

ASSESSMENT OF LIBRARY SKILLS AND TRAITS

OF

ENTERING AND LOWER LEVEL ENGLISH STUDENTS

Project of Olson Library Staff

Report Prepared by Rena Fowler, Director
Testing Administered by John Berens, Head of Public Services
With Much
Assistance from Paul Duby, Director, Institutional Research
And
Cooperation and Support from the:
English Department
And
Basic Skills Committee

Fall 1990

IR053859

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INTRODUCTION

In recent years, Library instruction has become an important part of the staff duties of any school or academic library. This has occurred as it has become increasingly apparent that neither students, instructors, nor staff have understood how to find and effectively apply resources and information which are critical to study, learning, and research. While there are many factors which impede the researcher, several might be considered here. Libraries are not by nature easy to use despite the centuries of effort invested by librarians in organizing materials. Many information-seekers would prefer to retreat to their textbook or ask their neighbor rather than hazard a trip to the library. This situation has been greatly exacerbated with the "information explosion" of the past generation and the expanded network of scholarly communication, both nationally and internationally.

Librarians have responded by broadening the scope of their instructional program to encompass not only the basic tools of access (the card catalog and the periodical index) but search strategies and critical thinking. The successful student must understand how information and resources are organized both in the scholarly world at large and in a discipline of study before beginning. Once the process is underway, the student must examine resources and information critically to select the best and most appropriate material. Without these approaches, the search for information quickly turns into the proverbial quest for a needle in a haystack.

Over the past decade, computer-based technology has been added to the now standard collection of print, audio, and video resources. The power of this new technology to change the form and distribution of information and research so long well-hidden on library shelves is both overwhelming and a marvel to contemplate. The card catalog is replaced by an online catalog. Important sources both within and without the library are now in machine-readable form and accessible through new search mechanisms over nearly any distance. Library instruction must also adapt to this new phenomenon. In many libraries, "information literacy" has become the new term and vehicle to introduce the skills required for successful access to resources.

The project described in this report grew out of a review of library instruction activities undertaken several years ago. The data was collected in the Fall of 1989, and the idea was first discussed over a year prior to that. It represents a small step in an effort to better understand the preparation of NMU's students for instruction in library and information use and provides a tool to assist staff in improving its program, one which must now be re-organized about an online--not card--catalog, and demonstrate broader access to resources distant from Northern Michigan University. Despite its specificity, the Library hopes other readers will find the study of interest and value.

BACKGROUND

Northern Michigan University is a public and primarily undergraduate institution with a student body of about 8,500 and a regional mission to serve the large, rural Upper Peninsula of the state. For some years the librarians of NMU's Olson Library have pursued an extensive program of course-related library instruction. The overall aim of this effort has been the preparation of students to carry out independent research and library/information use. Staff do offer orientation tours, a variety of sessions to meet the needs of special clientele, and an elective one-credit course in Undergraduate Library Research, but the centerpiece of the library instruction program is the class presentation which has been tailored to match the requirements of a library or research assignment. As the program has grown, staff now meet each year from 5,500 to 6,000 students in classes. To support this extensive program staff have formulated a goal statement and objectives to articulate content with the class level of instruction (Appendix 1).

An important feature of these objectives is the instruction offered to English classes. To meet university liberal studies requirements, students must complete a two-semester sequence of courses. Placement tests determine student capabilities and remedial coursework is given to those not ready for the basic freshman course. While library instruction is offered to all classes, the discussion of the basic principles of research has been placed in the second semester of the English sequence.

In periodic discussions of their work, staff have raised questions regarding the adequacy of the preparation of Northern's students for library research, the soundness of the instructional objectives set for the freshman and sophomore class levels, and possible weak points in the program's coverage. To explore these concerns, staff surveyed the literature for existing standardized tests of library skills.[1] Based upon this review, the Library Skills Test developed by the Illinois Association for College and Research Libraries was chosen to administer to a sample of NMU's freshman and sophomore students.[2] This test has had norms established both for a sample of Illinois college students and a national high school sample.

The Illinois Library Association's Bibliographic Instruction Committee has suggested the following score interpretations:

> College students scoring in the 40-45 range can be expected to understand library vocabulary and properly use basic tools. . . . College

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1 Evaluating Bibliographic Instruction: A Handbook. (Chicago: Association of College and Research Libraries, Bibliographic Instruction Section, 1983), 63-65.

2 Kirkendall, Carolyn A., ed. Teaching Library Use Competence (Ann Arbor: Pierian Press, 1982), 69-85.

students scoring in the 33-39 range probably will need special help when working on other than routine assignments. College students scoring below 33 cannot be expected to function effectively in the library.[3]

At NMU, the test was supplemented with a series of additional questions regarding the background and experience of the students. A copy of the Library Skills Test and additional questions are provided in Appendix 2.

RESEARCH QUESTIONS

Through this study, staff aimed to test the following hypotheses:

1. Students taking the Library Skills Test will match the national norms established for the twelfth grade.

2. Students enrolled in higher-level English classes will score higher on the test than those in lower-level classes.

3. Students with a better knowledge of library basic skills will have the following characteristics: be female, among the younger students, from downstate Michigan, from the academic track in high school, a frequent library user, and trained in library use; enjoy reading; expect a higher college GPA; and have an expected major in Arts and Sciences.

METHODOLOGY

The University's office of Institutional Research selected for us a stratified random sample of the English composition classes offered in the Fall of 1989. Twenty percent of the sections for each course were identified as follows:

EN 090	3	sections	48	students
EN 101	1	section	17	students
EN 111	7	sections	132	students
EN 211	4	sections	70	students
Total	15	sections	267	students

Courses and level:

EN 090 = Basic Composition for freshmen who fail to meet the entrance requirements

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3 Illinois Association of College and Research Libraries. Library Skills Test. (Bensenville, Ill.: Scholastic Testing Service, 1981), 3.

for the EN 111.

EN 101 = Learning Skill Development, a freshman elective for those who wish to improve their study skills.

EN 111 = College Composition, the first semester of the two-semester sequence which meets the university's liberal studies requirement for graduation.

EN 211 = This is the second semester of the composition sequence meeting the liberal studies requirement. The student may choose one of a number options and each has a different content: Writing and literature, narrative and descriptive writing, technical and report writing, and research and argumentative writing.

The Library's Head of Public Services worked with the English department faculty to secure their support for the project and to coordinate the administration of the test. Review of the results and further analysis were completed by Library staff and the Director of Institutional Research.

Means, medians, and standard deviations for Northern's sample, overall and by class, were compared against the twelfth grade national sample and the Illinois freshman sample. Statistically significant differences between the means for Northern's sample and the norms were sought.

RESULTS AND DISCUSSION

The distribution of scores does not a form a normal curve. More scores occur at the higher end of the scale. The distribution of scores for all students and for each class separately are attached (Appendix 3 a-f). Charts of the group means, medians, and standard deviations are also appended (Appendix 4) along with group scores on each test question (Appendix 5). Scores by NMU students on selected test questions are provided for further analysis (Appendix 6).

1. Performance of NMU students when compared to national and Illinois norms.

NMU students scored a mean of 34.3 on the Library Skills Test, while the sample of U.S. twelfth graders totalled 31.8. Thus, NMU students outscored the twelfth graders by several percentage points, and the differences are statistically significant (t-test value = 4.5229, $p < .05$). A mean of 34.3 would suggest to the Illinois Library Association that students might need help in completing more than the routine library assignment.

For specific groups of students, the results were as follows:

NMU students enrolled in EN 090 had a mean score of 31.5, just a bit less than the Grade 12 students. These differences were not significant. However, these NMU

students did not perform as well as the Illinois sample of freshmen, whose mean score was 34.6 and the differences were significant (t-test value = -3.86, $p < .05$). Since these NMU students did not pass the placement exam for entry into EN 111, this is the best that one might expect. These NMU students were performing at the level of the high school seniors in the national sample. By the standard of the Illinois Library Association, they would not be able to function in a library with a mean of 32.

Those NMU students enrolled in EN 111 had a mean score of 34.6, just the same as the Illinois freshmen. Thus, NMU freshman students who had been screened for entry into the college-level English sequence were as successful as the national sample of freshmen.

Two groups of sophomore level students were tested, a sample of those enrolled in EN 211A, Writing and Literature, and a second group of those enrolled in EN 211D, Technical and Report writing. The score for the 211A class was higher than the mean for those enrolled in 211D. Those in 211A scored 36.8 and those in 211D averaged 35.7. When each is compared with the mean for the Illinois freshmen, the students in EN 211A performed significantly better than the Illinois group (t-test value = 2.1112, $p < .05$) while the differences were not statistically significant for those in EN 211D. Thus, there are some differences between these classes in terms of their understanding of library research and use. Students enrolled in another option, 211B, Narrative and Descriptive Writing, were not included in the study.

The performance of the students in EN 101, Learning Skill Development, was not further examined because of the small number in the sample, but their results were included in the overall figures. Given the level of the course, the scores of the students seem consistent with other results.

2. Performance of NMU students upon individual test questions.

The data was further examined to look for indicators of differences among NMU students according to their scores upon individual test questions. A sample group score of less than 67% was selected as an indicator of student difficulty. By this measure, there were 11 test questions which were problematic for students. The question content and scores listed in Appendix 6 illustrate that more than one-third of NMU students tested did not understand the purposes of an abstract, could not follow a "see" reference to a correct subject heading, could not locate materials arranged in Library of Congress call number order, could not identify the component parts of citations in the New York Times Index, and could not distinguish between journal and book citations in Biography Index.

The low group scores on Questions #37 and #38 can be explained by the fact that the New york Times Index is largely absent from high school and small public libraries; thus, the citations in this index would be unfamiliar to NMU students. More

troublesome are the low group scores on questions that test knowledge of Library of Congress call number order, identification and use of abstracts and book indexes, and recognition of book versus periodical citations. If a third or more of NMU students cannot successfully locate books arranged by Library of Congress call numbers, then the process of information acquisition breaks down at the crucial final step. If a third or more of NMU students cannot recognize an abstract or a book index, then their effective use of both journal and book resources is limited. And if a third or more of NMU students cannot distinguish between book and periodical citations when the two are intermixed, the location of relevant subject bibliographies does not provide them with much useful information.

3. Performance of NMU students compared by class enrollment

Comparisons with the national high school students and Illinois freshmen do suggest the nature of the differences within the English classes at NMU. A review of the chart of group means shows that students in higher level classes received higher scores. To examine this further, the scores for each NMU class were compared through analysis of variance, and the differences were statistically significant (F value = 6.487, $p < .001$).

From the viewpoint of library skills, these results tend to confirm that those enrolled in the first semester of the liberal studies course, EN 111, have stronger backgrounds than those in EN 090. This reflects the placement testing in the English department. Furthermore, the students in Writing and Literature did better than those in Technical and Report Writing. Perhaps there are differences in enrollment based upon the purpose and content of these sections and the advisement of students into them.

4. Characteristics of NMU students

A chart of student responses to the additional questions is attached (Appendix 7). The distribution of responses is shown in percentages. In addition, mean scores on the Library Skills Test according to these characteristics were calculated (Appendix 8).

Correlations were made between the overall scores and these characteristics, but all were quite low. The primary reason would appear to be the lack of variability in the range of test scores. Again, the distribution was not normal and the scores were skewed toward the high end. One limitation of this test is that it is, in fact, fairly easy, enabling many students to score well. Unfortunately, there are few tests available with norms established and yet fewer which have been administered to college level students. While the test provides a useful measure for the performance of NMU's students against a national group, it proved rather less helpful in assessing traits associated with that performance. Beyond the test's nature, the results were also affected in some instances by a small number of cases.

The sample was evenly divided between men and women. The overwhelming majority were between 17 and 20, and younger students did score higher. Half were from the Upper Peninsula. Most reported that they had been in the academic track in high school and these scored better.

Students were asked if their high school had a library and a librarian, because there has been some concern that students do actually have library service--despite state standards which call for them. Overwhelmingly, students reported having a high school library and librarian. Almost three-quarters stated that they visited their high school library "sometimes" or "frequently," while less than half reported the same level of attendance at their public library within the past year. Over three-quarters said that they had had instruction in library use at the high school level.

Half had received instruction in college. When these responses are examined by class levels, there are differences, reflecting the emphasis of the Library's program:

Class level	Received instruction in library use in college
EN 090	26%
EN 101	100%
EN 111	45%
EN 211A	66%
EN 211D	60%

Students reporting instruction in college received higher mean scores on the test than those who had not; however, the differences are not significantly greater than one might expect by chance--and the correlation is quite low. Other factors in their background or class instruction might account for their performance, rather than the presence or absence of library instruction.

About three-quarters reported that they enjoyed reading for pleasure, and the more frequent reader fared better on the test.

Some 72% expected either a B or A for a college grade-point average, and those who sought and expected higher grades scored better on the test.

Of the total sample, over one-third expected to major in the School of Business; just under one-third in the School of Behavioral Sciences, Human Services, and Education; just under one-fifth in the School of Arts and Sciences; and between six and seven percent each for the Schools of Nursing and Applied Health Sciences and Technology and Applied Sciences. These frequencies do not match the proportions of students graduating each year from the Schools. For the Fall of 1989, enrollments by

major recorded many more students in the School of Arts and Sciences and fewer in the School of Business and the School of Behavioral Sciences, Human Services, and Education. The sample may reflect a particular pattern for the Fall Semester, the absence of students from one section of the English liberal studies sequence, or students' changing interests.

CONCLUSIONS

Generally, the results show that NMU's students are not different from the national population in terms of preparation to use the library and perform library research. By English class level, the study demonstrates that students in EN 111 and EN 211 have a rudimentary knowledge of library skills and are ready to build upon that to learn more about library research. Those enrolled in EN 090 are not yet ready for library research and would require assistance in basic use. There are many of these sections. For the Fall of 1989, there were 13 sections of EN 090 and 39 sections of EN 111 offered.

The performance of NMU's students upon specific test questions (Appendices 5 and 6) would indicate that the library instruction program might focus in particular upon skills relating to location of materials arranged by the Library of Congress classification system; use of book indexes and periodical abstracts to locate relevant information; and recognition of the different citation forms for books, periodicals, and other library resources. Each of these skills, which group scores indicated were lacking in one-third or more of the NMU students tested, is in itself an important library basic skill. The importance of these skills is heightened by the changed organization of information within NMU's library. Olson Library now has several distinct collections of materials (books and periodicals), each arranged by Library of Congress call numbers; thus, the ability to locate materials by this classification system is more important today than in the past. Likewise, the Library's online public catalog now provides references to a variety of materials--books, periodicals, audiovisual materials, and government publications. Students will increasingly need the skill to distinguish between the various citation forms for these materials.

If the overall goal of library instruction is to prepare students for independent learning after graduation, these are important concepts to understand.

High school librarians and teachers might be pleased with the preparation they give their students before they arrive at Northern Michigan University. Most reported receiving library instruction and most appear to have acquired a basic knowledge of library use and research skills.

In NMU's program of library instruction, staff might wish to pursue further research to test differences between those who do and do not receive library instruction and look more closely at the precise effects of library instruction upon student work. Despite

some effort to identify the impact of library instruction, this was not achieved in this project.

The exam that was administered to students was a traditional library skills test. Since the Library now has an online catalog and many reference sources are arriving in machine-readable format, some elements of library instruction and evaluation are changing and require adaptation.

This project suggests that better standardized tests, aimed at a college level audience, would be helpful in studying library skills, especially skills which might measure a wide range of achievement and higher level as well as basic methods. Reliable and valid skills tests are undoubtedly difficult to develop. Many librarians do question the ability to apply test results to actual student research. Nonetheless, in the absence of such measures, it is difficult to assess the effectiveness of a program, internally or externally.

Despite the limitations of the Library Skills Test and this study, the results have given the staff at Olson Library a better understanding of the capability of NMU's students upon entry to the University and provided information which will help us to strengthen our program, especially in working with the English Department classes.

LIBRARY INSTRUCTION

GOAL

Olson Library's library instruction program has as its main goal the development of self-reliant library users. Self-reliant library users can conceptualize the type and scope of information needed to address a problem, envision the steps required to obtain that information, determine appropriate sources to supply that information, and critically evaluate located information. Library instruction is presented in a variety of formats and methodologies, but all support the goal of developing self-reliant, independent library users.

Program Objectives:

Library instructions should promote:

1. Identification of the library as a primary source of information.

2. Identification of librarians as information facilitators.

3. Knowledge of the location of major units within the Library (e.g. Circulation, Information, Periodicals, Documents, CATS, Media Center).

4. Ability to use basic catalogs (card catalog, periodicals list) to locate specific library holdings.

5. Familiarity with basic reference sources in general.

6. Familiarity with specific reference sources in an individual's area of major concentration.

7. Knowledge of how information is organized in specific discipline/areas of concentration and the basic reference/access tools to this information.

8. Planning and implementation of basic search strategy. This includes:

   --defining types of information needed for particular assignments/problems

   --determining steps necessary to obtain this information

   --locating and using sources that will yield this information

   --applying search strategy across the disciplines

9. Critical selection and evaluation of materials located through search strategy.

Appropriate Levels of Instruction:

Objective #	Orientation	High School/ Remedial	100-Level	200-Level	300/400-Level (Major)	Graduate	Faculty	Special Groups (e.g., Handicapped, Foreign)
1	X	X	X					X
2	X	X	X				X	X
3	X	X	X				X	X
4		X	X					X
5			X	X				X
6				X	X	X	X	
7					X	X	X	
8			X	X	X	X		X
9					X	X		

Library Skills Test

Illinois Association of
College and Research Libraries

Published by:
SCHOLASTIC TESTING SERVICE, INC., Bensenville, Illinois 60106

PART I
Using Library Terminology

For items 1 to 12 mark on the answer sheet the letter of the response that best matches the definition.

1. A magazine or journal that is issued at regular intervals:
   a) abstract
   b) index
   c) pamphlet
   d) periodical

2. A list of books and other materials which have some relationship to each other:
   a) autobiography
   b) bibliography
   c) biography
   d) footnote

3. An alphabetical listing of topics mentioned in a book, periodical, or other material:
   a) appendix
   b) biography
   c) index
   d) table of contents

4. The history of an individual from birth to death written by another person:
   a) autobiography
   b) bibliography
   c) biography
   d) index

5. A summary of the contents of an article, book, or other material:
   a) abstract
   b) index
   c) pamphlet
   d) periodical

6. Items in great demand (often placed on reading lists) which are available for limited loan periods in a special section of the library or learning resource center:
   a) microform material
   b) newspaper material
   c) reference material
   d) reserve material

7. That place in a library or learning resource center where materials are charged out, returned, etc.:
   a) circulation desk
   b) reference or information desk
   c) periodicals room
   d) stacks area

8. A place in a library or learning resource center staffed by one or more persons whose functions are to answer questions and provide help in using the library:
   a) circulation desk
   b) reference or information desk
   c) periodicals room
   d) stacks area

9. A collection of newspaper clippings, brochures, or other materials of current information on any subject:
   a) audiovisual materials
   b) card catalog
   c) periodical index
   d) vertical or pamphlet file

10. A greatly reduced photographic reproduction of printed matter on film:
    a) audiotape
    b) microform
    c) poster
    d) periodical

11. Non-book items such as sound-recordings, slides, charts, models, etc.:
    a) audiovisual materials
    b) indexes
    c) microforms
    d) reference materials

12. The life of a person written by that person:
    a) autobiography
    b) bibliography
    c) biography
    d) concordance

Go on to the next page.

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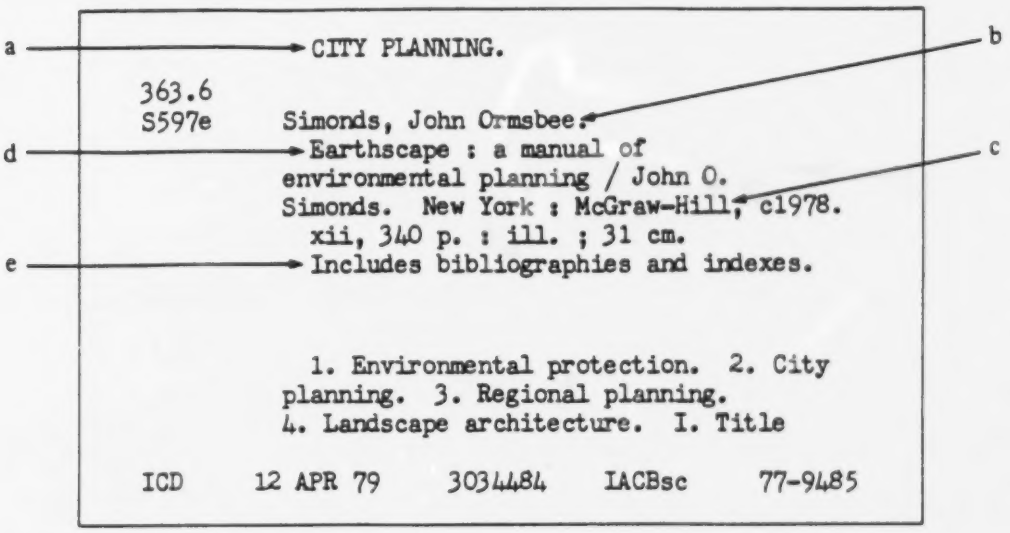
PART II
Interpreting Catalog Cards

For items 13 to 19 mark on the answer sheet the letter which identifies the correct term on the catalog card.


a
b
c
d
e
CITY PLANNING.
363.6
S597e
Simonds, John Ormsbee.
Earthscape : a manual of environmental planning / John O. Simonds. New York : McGraw-Hill, c1978.
xii, 340 p. : ill. ; 31 cm.
Includes bibliographies and indexes.
1. Environmental protection. 2. City planning. 3. Regional planning. 4. Landscape architecture. I. Title
ICD 12 APR 79 3034484 IACBsc 77-9485

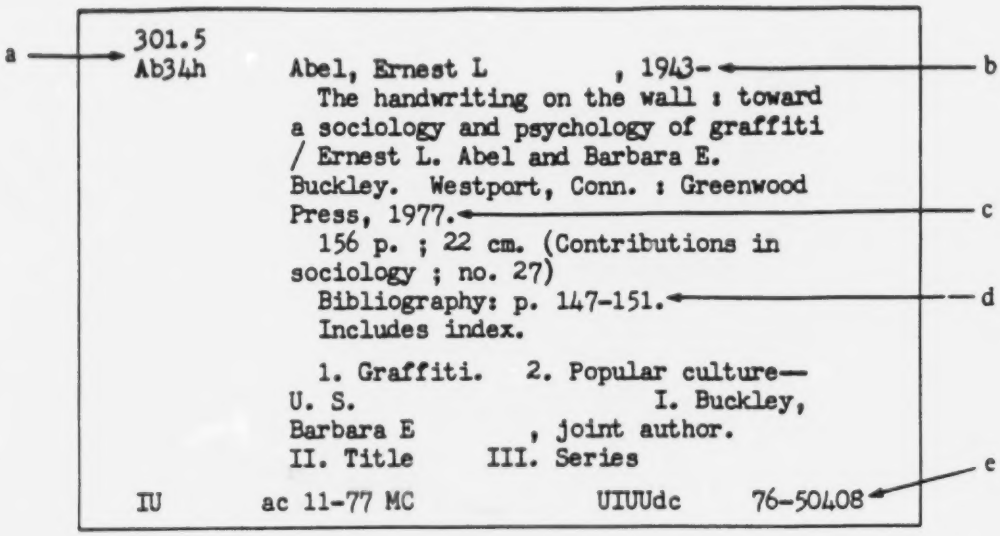
13. The publisher of this book is
    a. b. c. d. e.

14. The author of this book is
    a. b. c. d. e.

15. A subject heading for this book is
    a. b. c. d. e.

16. The title of this book is
    a. b. c. d. e.

Go on to the next page.

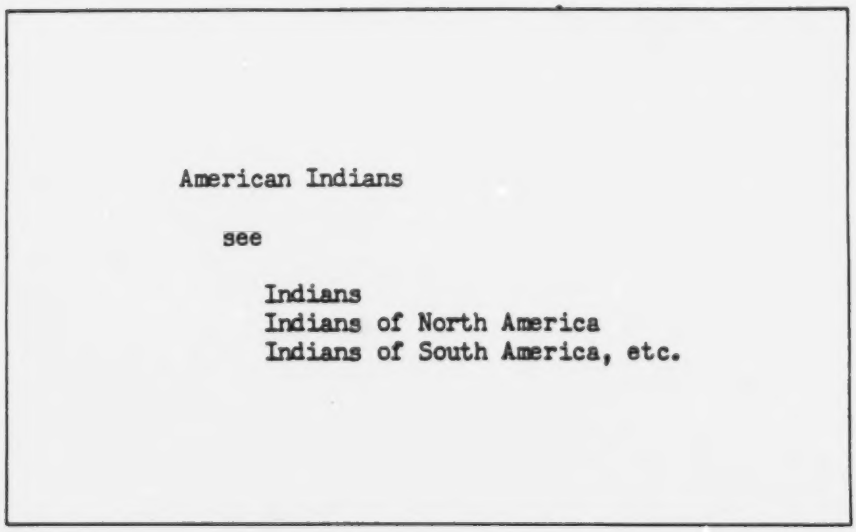

a
301.5
Ab34h
Abel, Ernest L , 1943-
b
The handwriting on the wall : toward a sociology and psychology of graffiti / Ernest L. Abel and Barbara E. Buckley. Westport, Conn. : Greenwood Press, 1977.
c
156 p. ; 22 cm. (Contributions in sociology ; no. 27)
Bibliography: p. 147-151.
d
Includes index.
1. Graffiti. 2. Popular culture—U. S. I. Buckley, Barbara E , joint author.
II. Title III. Series
e
IU ac 11-77 MC UIUUdc 76-50408

17. The date of publication of the book is

a. b. c. d. e.

18. The call number is

a. b. c. d. e.



19. The card above means that

a) all of the terms on the card are subject headings used in the card catalog.
b) "American Indians" is not a subject heading in the card catalog but the terms below are.
c) "Indians" is not a subject heading used in the card catalog.
d) these terms are the only subject headings used for information related to Indians in the Western Hemisphere.

Go on to the next page.

PART III
Arranging Call Numbers

The following lists of call numbers are in the order in which the books would be put on the library shelves. For items 20 to 23, mark on the answer sheet the letter of the response which bests completes each statement.

DEWEY DECIMAL CLASSIFICATION SYSTEM					
(a) 959.6 B47en	(b) 960.5 F16c	(c) 963.73 N523ar	(d) 965.01 GARD	(e) 966 W244br	(f) 966.5 St76u

20. A book with the call number 966.3 Un36f would be placed on the shelf

a) between (b) and (c).
b) between (d) and (e).
c) between (e) and (f).
d) after (f).

21. A book with the call number 962.78 T45ra would be placed on the shelf

a) between (a) and (b).
b) between (b) and (c).
c) between (c) and (d).
d) after (f).

LIBRARY OF CONGRESS CLASSIFICATION SYSTEM					
(a) L 112 .C62	(b) L 112 .N377a	(c) LA 106 .W7	(d) LA 205 .B88	(e) LB 1028.5 .M3	(f) LC 5141 .C76

22. A book with the call number L 1010 .D12 would be placed on the shelf

a) before (a).
b) between (a) and (b).
c) between (b) and (c).
d) between (c) and (d).

23. A book with the call number LA 8601 .B89 would be placed on the shelf

a) between (b) and (c).
b) between (c) and (d).
c) between (d) and (e).
d) after (f).

Go on to the next page.

PART IV
Recognizing the Parts of a Book

For items 24 to 29, mark on the answer sheet the letter of the response which best completes the statement.

24. The part of a book that gives the name of the author, the name of the book, the publisher, and the date and place of publication is the

    a) appendix.
    b) bibliography.
    c) index.
    d) title page.

25. The list of chapters, the subdivisions, and the corresponding page numbers make up the

    a) appendix.
    b) glossary.
    c) index.
    d) table of contents.

26. A list of definitions of difficult or technical words usually found near the end of the book is the

    a) appendix.
    b) bibliography.
    c) glossary.
    d) index.

27. The author or the general editor of a book speaks directly to the readers in the

    a) appendix.
    b) glossary.
    c) preface.
    d) title page.

28. The detailed reference to an original source supporting an important fact or idea in a research paper is the

    a) bibliography.
    b) footnote.
    c) introduction.
    d) preface.

29. In order to determine how thoroughly a topic is covered in a book, look up the topic in the

    a) appendix.
    b) glossary.
    c) index.
    d) preface.

Go on to the next page.

PART V
Interpreting an Index

For items 30 to 35, use this excerpt from *Readers' Guide to Periodical Literature*. Mark on the answer sheet the responses that best complete the statements.

SOLAR energy
Scientists urge President: stop reliance on coal and nuclear fuel; Go for development of uniform solar power. J. E. Persico. Sci Digest 82:8-9 + O '77
Sunshine of your life. R. W. Moss. il Sci Digest 82:10-18 + O '77
Toward a solar civilization. F. Von Hippel and R. H. Williams. bibl il Bull Atom Sci 33:12-15 O '77
See also
Ocean thermal power plants
United States–Energy Research and Development Administration–Ocean Thermal Energy Conversion Program

30. How many periodical articles are listed under the subject "solar energy"?
    a) 2
    b) 3
    c) 4
    d) 5

31. Another subject heading in *Readers' Guide* under which you could look to find additional articles on solar energy is
    a) "Ocean thermal power plants."
    b) "Sunshine of your life."
    c) "Coal and nuclear fuel."
    d) "Solar civilization."

The next four questions refer to the circled entry.

32. The title of the periodical in which the circled article appears is
    a) il Bull Atom Sci.
    b) Bull Atom Sci.
    c) il Bull.
    d) F. Von Hippel.

33. The abbreviation "bibl" means
    a) biography.
    b) bibvalent.
    c) biological.
    d) bibliography.

34. The article begins on page
    a) 12.
    b) 33.
    c) 77.
    d) 82.

35. The volume of the periodical is
    a) 12.
    b) 33.
    c) 77.
    d) 82.

For items 36 to 39 use this excerpt from the *New York Times Index*. Mark on the answer sheet the responses that best complete the statements.

a → **CAPITAL Punishment. See also** Middle East – Israeli-Arab Conflict, JI 7. Terrorism (General), JI 7, 14. Personal names
NYS Legis to weigh extending death penalty to persons convicted of acts of terrorism (S), Ja 4,44:6
b → Ed on Judge Samuel Conti's comment concerning capital punishment following his sentencing of Sara Jane Moore to life imprisonment for attempted murder of Pres Ford; says Conti's hypothesis that death penalty would deter persons of Moore's bent from resorting to acts of violence cannot be substantiated by history or psychology, Ja 17,24:2

c d e

36. The subject heading is
    a. b. c. d. e.

37. The page on which the article appears is
    a. b. c. d. e.

38. The column number for the article is
    a. b. c. d. e.

39. The date of the article is
    a. b. c. d. e.

Go on to the next page.

PART VI
Using Reference Sources

For items 40 to 43, mark on the answer sheet the letter of the response which best completes each statement.

40. An almanac is to facts as a thesaurus is to
    a) antonyms.
    b) heteronyms.
    c) homonyms.
    d) synonyms.

41. The reference book which provides the most extensive listing of words in any language is the
    a) abridged dictionary.
    b) biographical dictionary.
    c) geographical dictionary.
    d) unabridged dictionary.

42. Background information needed for a term paper can generally be found in the
    a) dictionary.
    b) encyclopedia.
    c) gazetteer.
    d) handbook.

43. The reference source most likely to provide guidance in locating very current information is the
    a) anthology.
    b) book review index.
    c) encyclopedia.
    d) periodical index.

PART VII
Distinguishing Bibliographic Forms

For items 44 and 45, use this excerpt from *Biography Index*. Mark on the answer sheet the letter of the response that best completes the statement.

JOHNSON, Lyndon Baines, 1908-1973, president
1 – Cormier, Frank. LBJ: the way he was. Doubleday '77 276p il pors
2 – Drugger, R. LBJ, rampant & couchant. Nation 223:180-2 S 4 '76
3 – Graff, H. F. Lyndon B. Johnson: frustrated achiever, (In Power and the presidency. Scribner '76 p 153-63) il pors
4 – King, L. L. Machismo in the White House: LBJ and Vietnam. il pors Am Heritage 27:8-13+ Ag '76
5 – Lorant, Stefan. Glorious burden. Authors ed. '76 p 811-902. il pors

44. Which of the following entry numbers are for magazine or journal articles about Lyndon Johnson?
    a) 1 and 3
    b) 1, 3, and 4
    c) 2 and 4
    d) 2 and 5

45. Which of the following entry numbers are for books or parts of books about Johnson?
    a) 1 and 3
    b) 1, 3, and 5
    c) 1, 4, and 5
    d) 2 and 4

46. What is your sex?
    a) Male b) Female

47. What is your age?
    a) 17-20 b) 21-24 c) 25 or older

48. Where was your high school located?
    a) Marquette County
    b) Upper Peninsula (excluding Marquette County)
    c) Lower Peninsula
    d) out of state

49. What high school track were you enrolled in?
    a) Vocational b) General c) Academic

50. Did your high school have a library?
    a) Yes b) No
    If no, skip to Question #54

51. Did you use your high school library?
    a) Not at all c) Sometimes
    b) Rarely d) Frequently

52. Did your high school have a librarian?
    a) No b) Not sure c) Yes

53. Did you have instruction in library use in high school?
    a) Yes b) No

54. Have you had instruction in library use in college?
    a) Yes b) No

55. How often have you used a public library within the past year?
    a) Not at all c) Sometimes
    b) Rarely d) Frequently

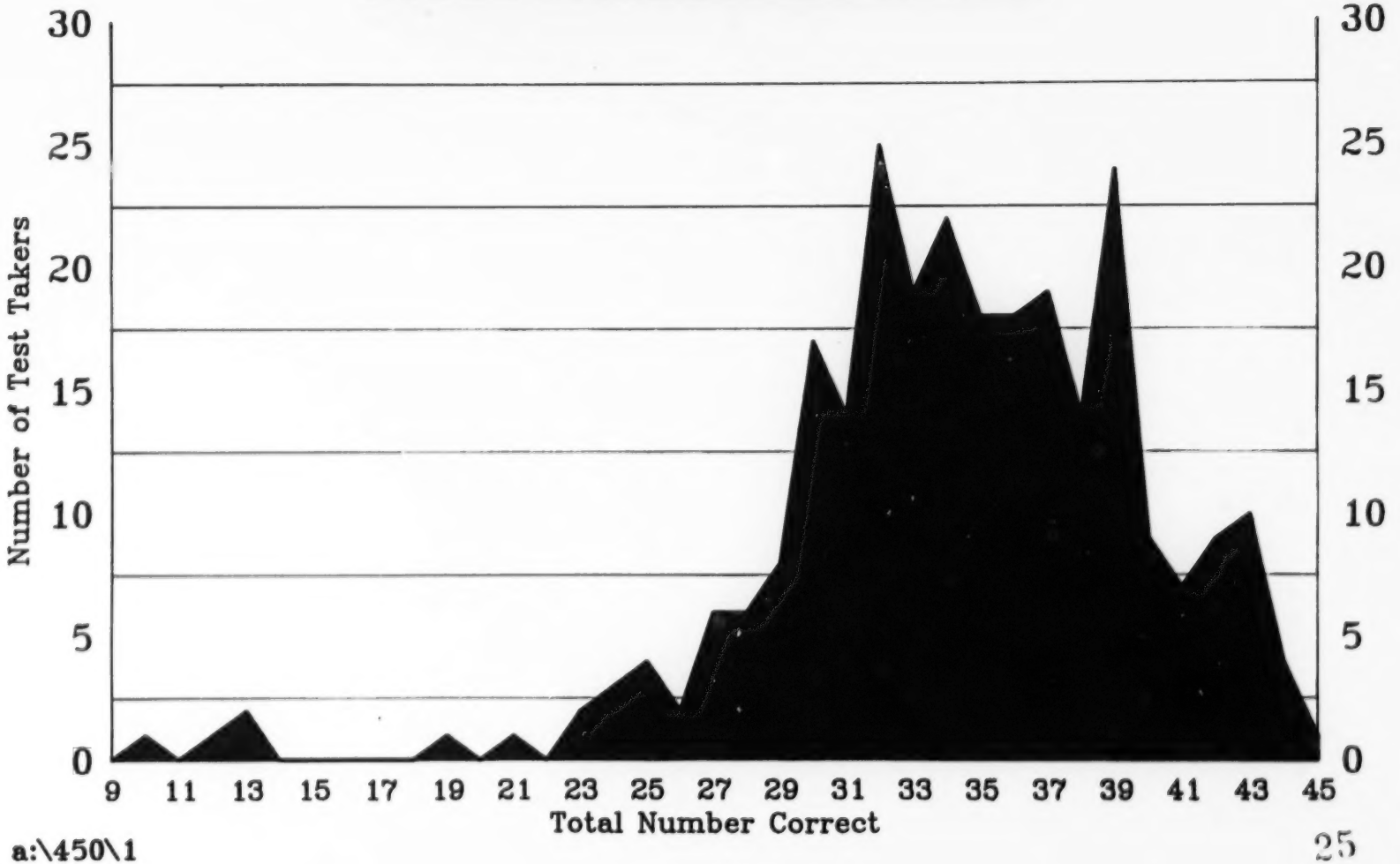
56. Do you enjoy reading for pleasure?
    a) Not at all c) Sometimes
    b) Rarely d) Frequently

57. What School at Northern Michigan University is your expected major program located in?
    a) Arts and Science
    b) Behavioral Sciences, Human Services, and Education
    c) Business
    d) Nursing and Allied Health Sciences
    e) Technology and Applied Sciences

58. What do you expect your approximate college grade point average to be?
    a) less than C c) B
    b) C d) A

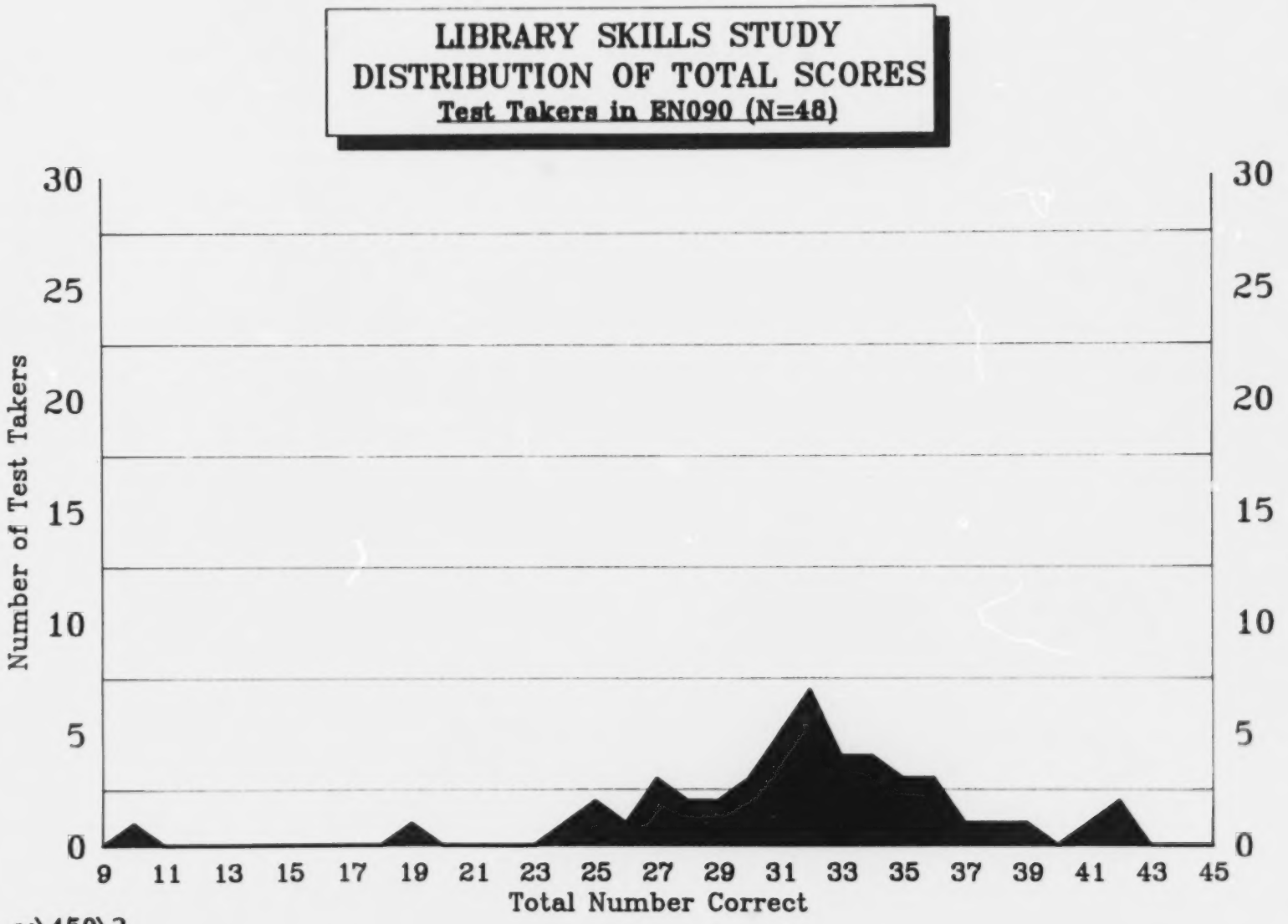
Appendix 3a

LIBRARY SKILLS STUDY
DISTRIBUTION OF TOTAL SCORES
All Test Takers (N=267)



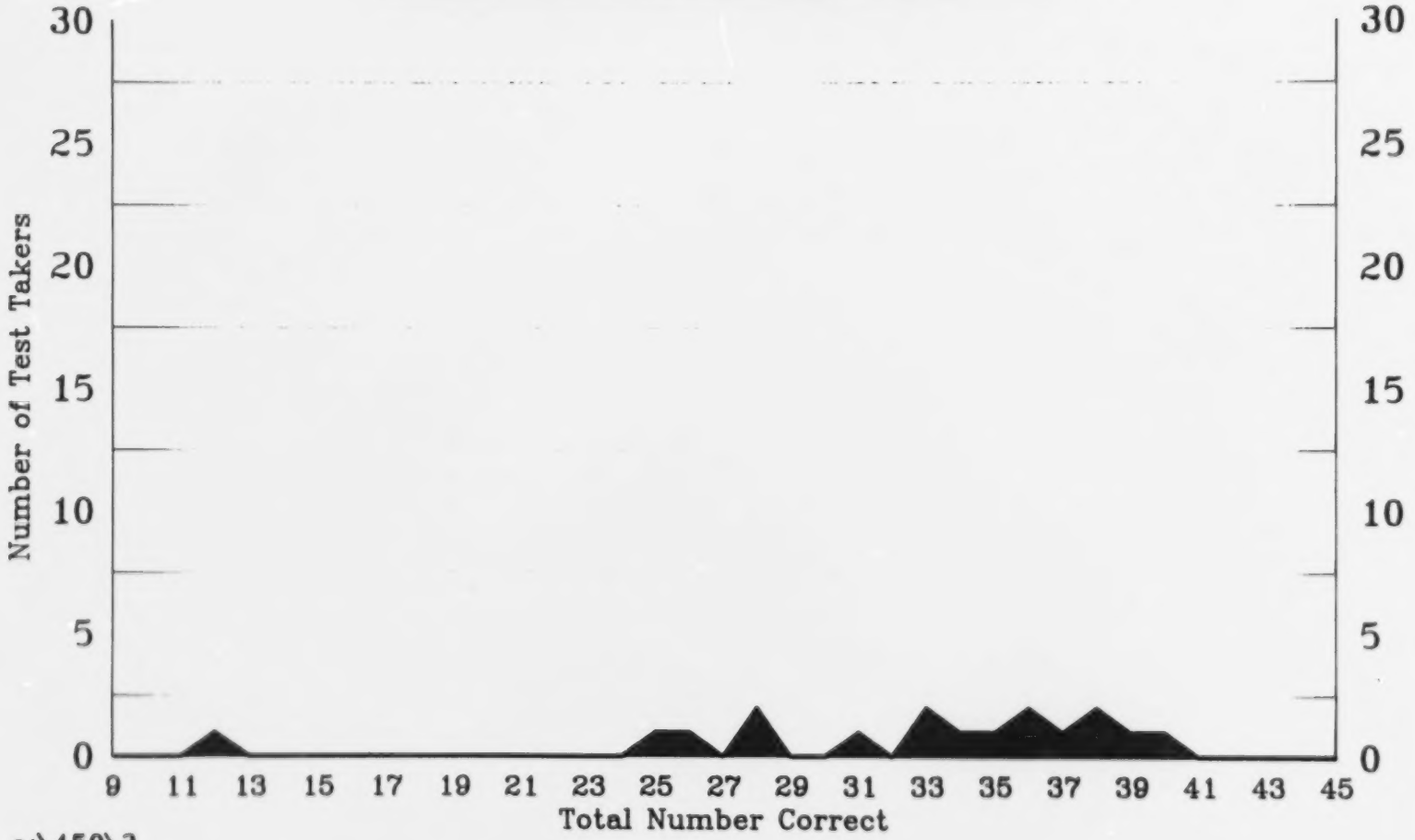
a:\450\1

Appendix 3b


LIBRARY SKILLS STUDY
DISTRIBUTION OF TOTAL SCORES
Test Takers in EN090 (N=48)
Number of Test Takers
30
25
20
15
10
5
0
9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45
Total Number Correct
a:\450\2

Appendix 3c

LIBRARY SKILLS STUDY
DISTRIBUTION OF TOTAL SCORES
Test Takers In EN101 (N=17)



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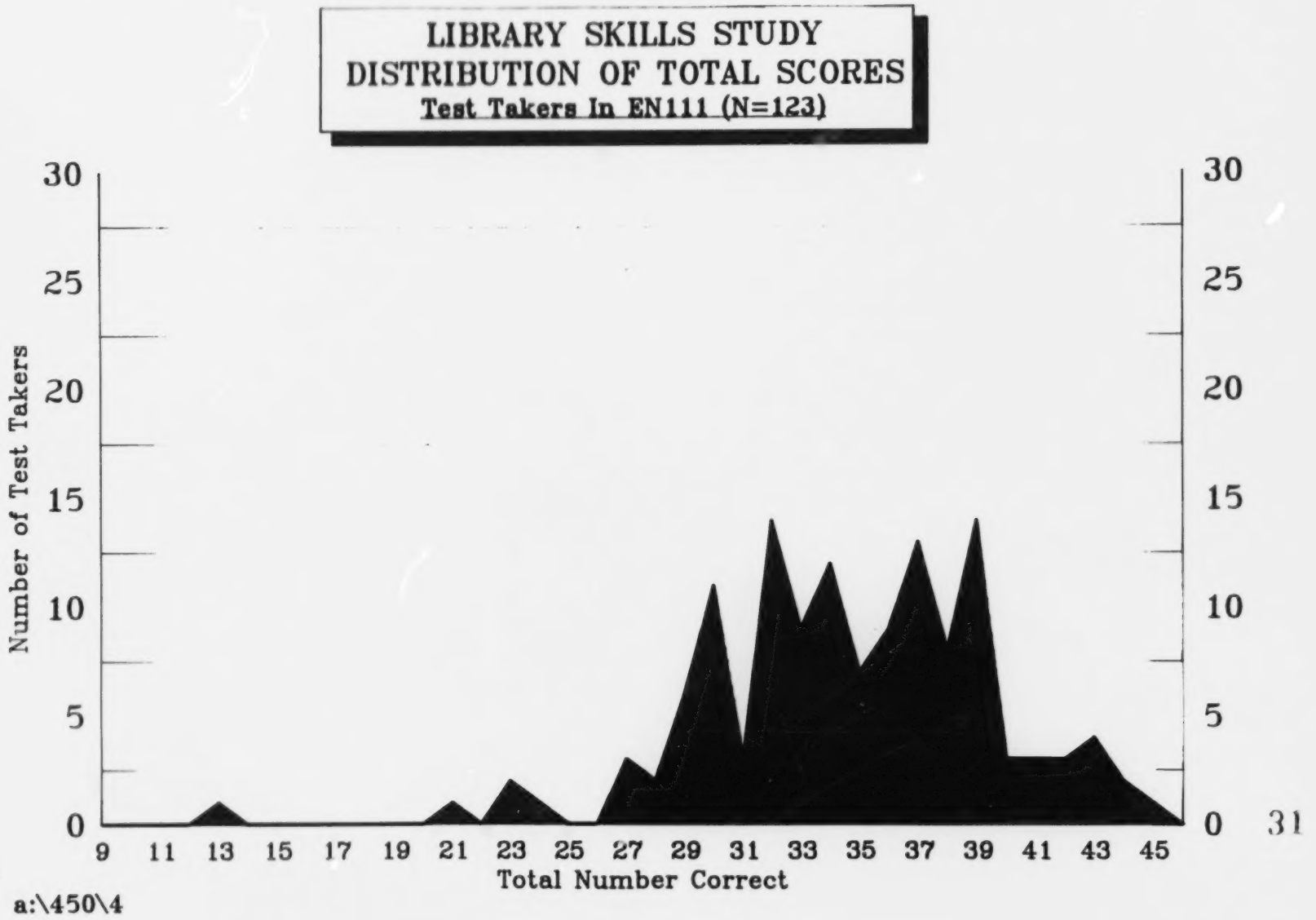
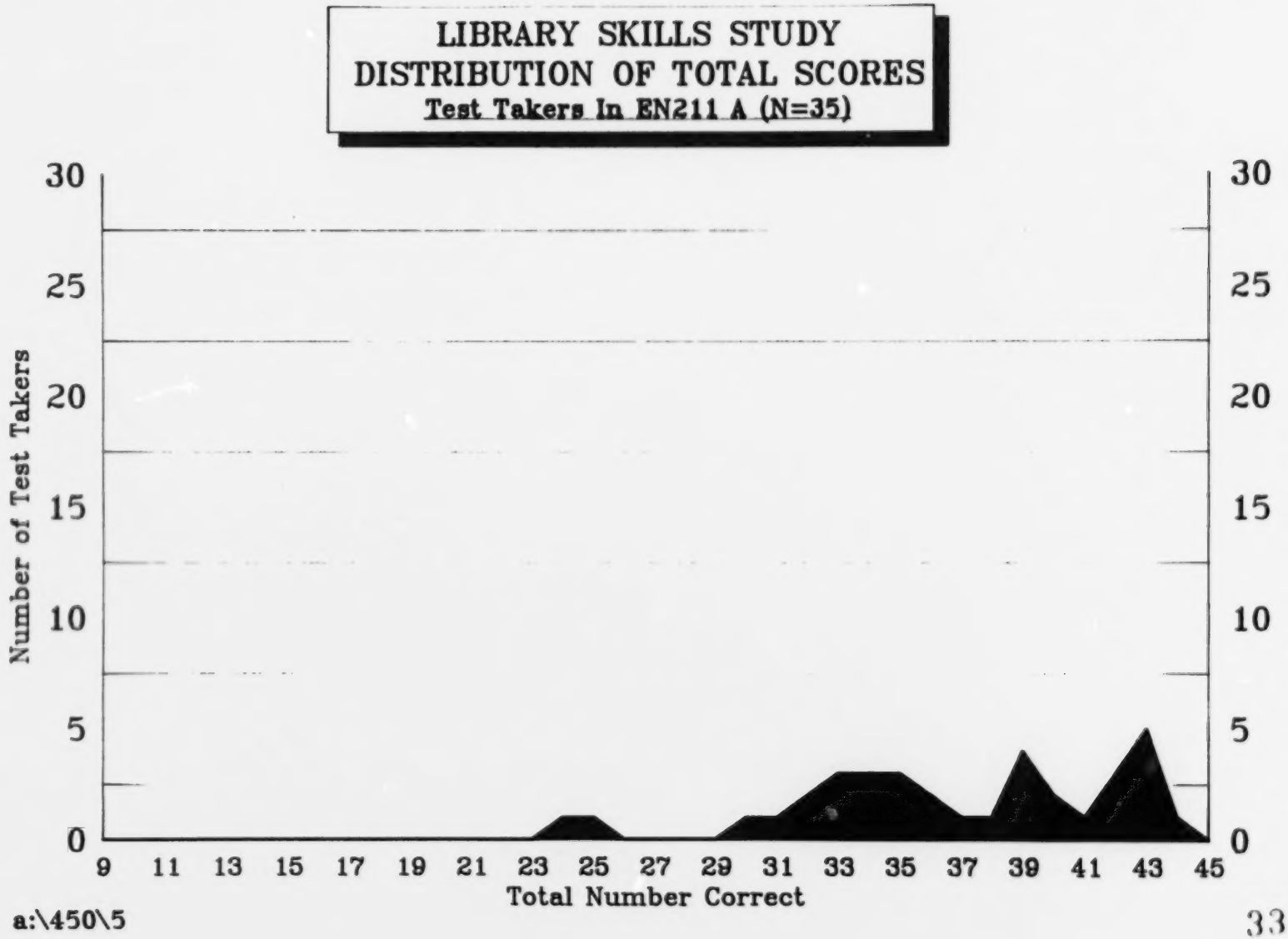
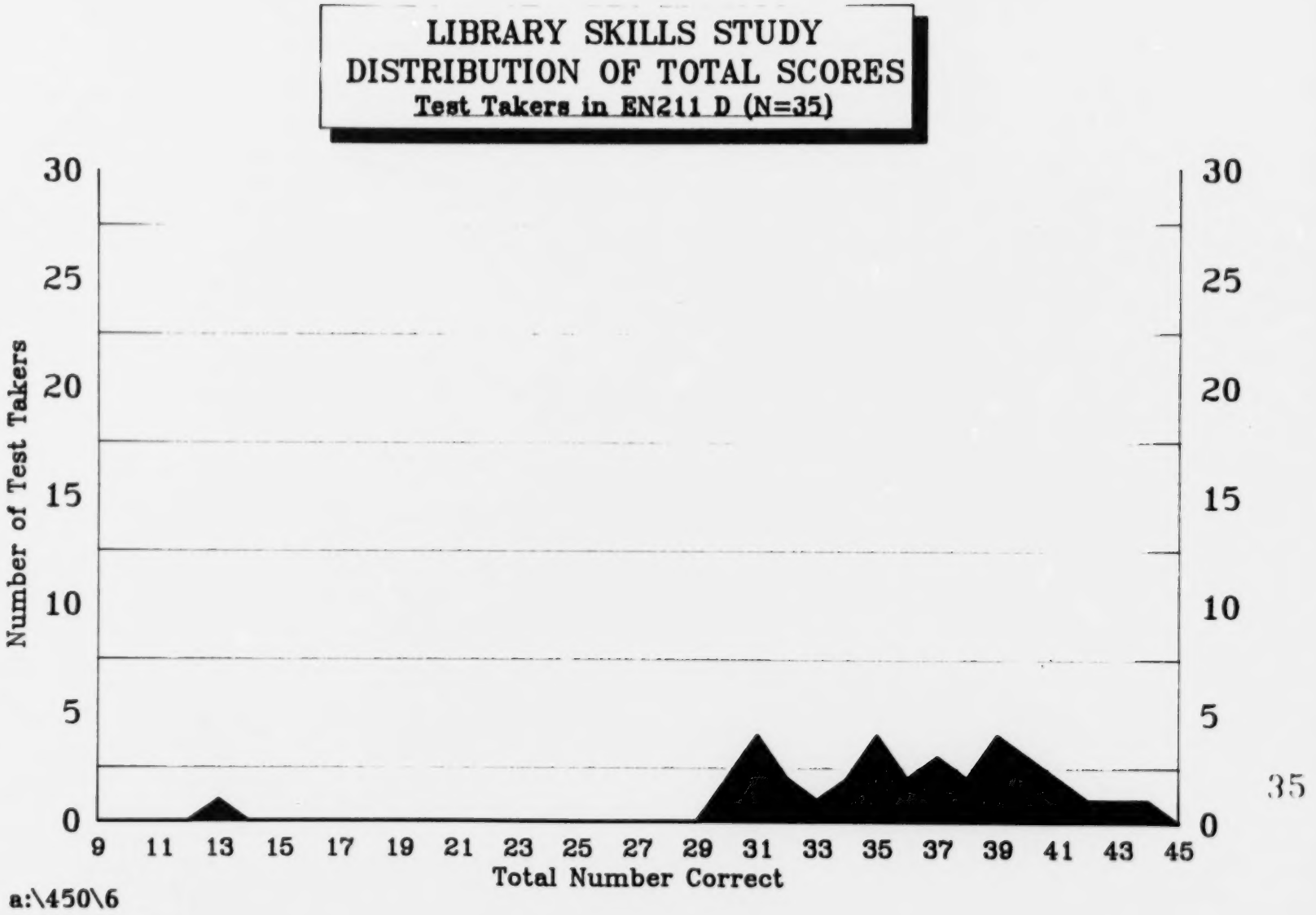
Appendix 3d


LIBRARY SKILLS STUDY
DISTRIBUTION OF TOTAL SCORES
Test Takers In EN111 (N=123)
Number of Test Takers
0
5
10
15
20
25
30
9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45
Total Number Correct
a:\450\4


LIBRARY SKILLS STUDY
DISTRIBUTION OF TOTAL SCORES
Test Takers In EN211 A (N=35)
Number of Test Takers
0
5
10
15
20
25
30
9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45
Total Number Correct
a:\450\5


LIBRARY SKILLS STUDY
DISTRIBUTION OF TOTAL SCORES
Test Takers in EN211 D (N=35)
Number of Test Takers
30
25
20
15
10
5
0
9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45
Total Number Correct
a:\450\6

Library Skills Test: Group Means, Medians, Standard Deviations

	NMU Total	EN 090	EN 101	EN 111	EN211A	EN211D	US Gr 12	Ill. Frosh
Mean	34.3	31.5	32.3	34.6	36.8	35.7	31.8	34.6
Median	34	32	34	35	37	36	32	35
Stand. Dev	5.5	5.6	7	5	5.1	5.5	8.2	6.1
Number	267	48	17	132	35	35	500	1200

Library Skills Test: Group Scores on Test Questions

Question	NMU Total	EN 090	EN 101	EN 111	EN 211A	EN 211D	US Gr 12	Ill. Frosh.
Part I								
1	90	85	71	91	94	100	82	90
2	79	71	77	78	91	86	70	79
3	65	48	77	67	77	66	70	64
4	68	52	59	70	71	83	61	73
5	54	27	59	48	71	94	49	50
6	66	60	41	70	77	62	45	73
7	91	88	88	91	94	91	73	91
8	94	94	88	94	100	89	89	96
9	74	75	77	73	71	74	71	75
10	93	88	88	95	97	94	82	90
11	93	94	82	93	94	94	87	94
12	84	88	77	83	80	91	74	85
Part II								
13	97	92	100	97	100	97	92	98
14	98	96	100	99	100	97	94	98
15	69	60	65	65	83	80	58	65
16	69	60	65	65	83	83	57	65
17	83	75	88	86	80	83	77	85
18	82	77	94	80	86	89	82	89
19	66	46	71	67	74	74	61	63
Part III								
20	91	83	100	95	91	80	85	86
21	92	94	100	90	94	89	88	89
22	42	43	29	43	49	37	39	35
23	76	72	82	74	74	85	76	80
Part IV								
24	70	63	82	74	74	51	72	76
25	84	79	82	83	86	91	80	88
26	89	94	88	88	87	89	86	88
27	92	90	82	92	94	94	89	95
28	79	85	71	82	71	71	78	85
29	51	42	35	51	69	51	51	56
Part V								
30	69	49	47	74	80	74	55	66
31	85	83	53	89	86	86	75	82
32	76	66	59	78	83	83	63	75
33	91	81	82	96	91	91	85	89
34	91	91	82	91	94	94	82	92
35	88	85	77	87	94	94	74	86
36	97	98	94	98	100	94	94	97
37	47	54	35	45	54	44	47	51
38	46	45	35	48	54	40	52	54
39	88	83	82	87	94	91	79	85

Library Skills Test: Group Scores on Test Questions

Question	NMU Total	EN 090	EN 101	EN 111	EN 211A	EN 211D	US Gr 12	Ill. Frosh.
Part VI								
40	68	61	82	69	66	71	49	58
41	62	53	41	61	86	66	58	64
42	89	85	88	90	89	91	85	87
43	85	81	94	86	89	80	70	84
Part VII								
44	39	28	18	37	51	60	43	46
45	44	21	41	48	52	51	46	47

Appendix 6

SCORES BY NMU STUDENTS ON SELECTED TEST QUESTIONS

Listed below are the test questions and scores for which the NMU sample score was less than 67% correct.

Question No.	Nature of Question	NMU Score
3	Definition of a book's index	65%
5	Identification of an abstract	54%
6	Identification of reserve materials	66%
19	Identification of a "see" reference	66%
22	Library of Congress call number order	42%
29	Identification of a book's index	51%
37	Identification of a page reference in the New York Times Index	47%
38	Identification of a column reference in the New York Times Index	46%
41	Identification of an unabridged dictionary	62%
44	Identification of journal citations in Biography Index	39%
45	Identification of book citations in Biography Index	44%

CHARACTERISTICS OF NMU STUDENTS IN SAMPLE

46. What is your sex?
    a) Male = 50.4% b) Female = 49.6%

47. What is your age?
    a) 17-20 = 82.3% b) 21-24 = 10.2% c) 25+ = 7.5%

48. Where was your high school located?
    a) Marquette County = 25.0%
    b) Upper Peninsula (exc. Marquette Co.) = 26.1%
    c) Lower Peninsula = 36.4%
    d) out of state = 12.5%

49. What high school track were your enrolled in?
    a) Vocational = 6.1% b) General = 36.5% c) Academic = 57.4%

50. Did your high school have a library?
    a) Yes = 98.5% b) No = 1.5%

51. Did you use your high school library?
    a) Not at all = 3.4% c) Sometimes = 56.1%
    b) Rarely = 22.5% d) Frequently = 17.9%

52. Did your high school have a librarian?
    a) No = 4.2% b) Not sure = 1.2% c) Yes = 94.6%

53. Did you have instruction in library use in high school?
    a) Yes = 78% b) No = 22%

54. Have you had instruction in library use in college?
    a) Yes = 50.4% b) No = 49.6%

55. How often have you used a public library within the past year?
    a) Not at all = 21.7% c) Sometimes = 24.0%
    b) Rarely = 36.5% d) Frequently = 17.9%

56. Do you enjoy reading for pleasure?
    a) Not at all = 5.7% c) Sometimes = 48.9%
    b) Rarely = 18.3% d) Frequently = 27.1%

57. What School at NMU is your expected major program in?
    a) Arts and Sciences = 18.9%
    b) Behavioral Sciences, Human Services, and Education = 33.2%

c) Business = 35.1%
d) Nursing and Allied Health Sciences = 6.2%
e) Technology and Applied Sciences = 6.6%

58. What do you expect your approximate college grade point average to be?
a) less than C = 2.4%
b) C = 25.9%
c) B = 65.6%
d) A = 6.3%

CHARACTERISTICS OF NMU STUDENTS BY MEAN TEST SCORE

46. Score and Percent Correct by Gender

	Female	Male
Mean	34.76	33.97
%	77.2%	75.5%
Cases	131	133

47. Score and Percent Correct by Age

	25+	21-24	17-20
Mean	32.45	34.00	34.59
%	72.1%	75.6%	76.9%
Cases	20	27	218

48. Score and Percent Correct by High School Location

	Out of State	Lower P.	U.P.-Exc.Marq.	Marquette
Mean	34.06	34.82	34.32	33.96
%	75.7%	77.4%	76.3%	75.5%
Cases	33	96	69	66

49. Score and Percent Correct by High School Track

	Academic	General	Vocational
Mean	35.37	33.06	34.06
%	78.1%	73.5%	75.7%
Cases	151	96	16

50. Score and Percent Correct by Presence of High School Library

	No	Yes
Mean	30.25	34.52
%	67.2%	67.7%
Cases	4	258

51. Score and Percent Correct by Use of High School Library

	Frequent	Sometimes	Rarely	Not at all
Mean	35.21	34.42	33.75	35.22
%	78.3%	76.5%	75.0%	78.3%
Cases	47	147	59	9

52. Score and Percent Correct by Presence of High School Librarian

	No	Not sure	Yes
Mean	32.73	29	34.58
%	72.7%	64.4%	76.8%
Cases	11	3	245

53. Score and Percent Correct by Library Instruction in High School

	No	Yes
Mean	34.65	34.46
%	77%	76.6%
Cases	57	202

54. Score and Percent Correct by Library Instruction in College

	No	Yes
Mean	34.16	34.86
%	75.9%	77.5%
Cases	128	130

55. Score and Percent Correct by Use of Public Library

	Frequently	Sometimes	Rarely	Not at all
Mean	35.13	34.25	33.64	35.67
%	78.1%	76.1%	74.7%	79.3%
Cases	47	63	96	57

56. Score and Percent Correct by Reading for Pleasure

	Frequently	Sometimes	Rarely	Not at all
Mean	36.41	33.76	33.10	33.93
%	80.9%	75.0%	73.6%	75.4%
Cases	71	128	48	15

57. Score and Percent Correct by NMU Program

	STAS	Nursing	Business	BSHSE	A&S
Mean	31.59	35.5	34.14	34.44	35.9
%	70.2%	78.9%	75.9%	76.5%	79.8%
Cases	17	16	91	86	49

58. Score and Percent Correct by Expected GPA

	A	B	C	Less than C
Mean	37.38	34.64	33.74	28.83
%	83.1%	77.0%	75.0%	64.1%
Cases	16	167	66	6